ROCKS and MINERALS

PUBLISHED MONTHLY

Edited and Published by PETER ZODAC

March 1944

Contents for March, 1944

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ROCKS and MINERALS PEEKSKILL, N. Y., U. S. A.

The official Journal of the Rocks and Minerals Association

Chips from the Quarry

Did You Notice?

Did you notice that the February, 1944, issue of ROCKS & MINERALS, carried more advertisements than text matter? There were 20 pages devoted to advertising and only 18 to text. As a matter of fact we had to add 4 pages in order to take care of the extra advertising. Under ordinary conditions the addition of 4, 8, or even 12 extra pages is a simple matter but during the present war time conditions it is quite a problem to increase the number of pages of the magazine. Paper is now not only high in price but most difficult to obtain.

In order to take care of increased advertising we are forced to eliminate some regular features of the magazine—or rather suspend them for the time being. The Club Directory, Collectors' Tales, Questions and Answers will appear every 3 or 4 months or at such times as room for them may be found.

Lapidary Articles Wanted

We have not as yet received any contributions for The Amateur Lapidary Department as requested in the last issue. Perhaps one or two contributions may arrive before this month is over. If this department is to be continued, readers should cooperate with notes covering their experiences.

Junior Mineral Exchange

A mineral club for boys, 13 to 17 years of age, is being formed in Revere, Mass., by Jerome Eisenberg and George Myers. The name of the club is Junior Mineral Exchange. All those interested may obtain more information by contacting Jerome Eisenberg, 77 Victoria St., Revere 51, Mass.

A Tribute to the Editor!

Mr. Peter Zodac,
Editor R & M,
Dear Friend Zodac:

Today I received your price list of back numbers of ROCKS AND MINERALS. As I looked carefully over every page it made me think that it would almost serve as a general index of the magazine since 1926.

But the thing that impressed me above everything else was the trainload of excellent information on mineralogy, geology, etc. that has been disseminated the past 18 years by this little magazine. Each number, when it reaches its subscribers, doesn't seem so large, but when more than 100 of them get together they surely contain a lot of information and pleasant reading. All this is due to your efforts and I congratulate you on spreading "the gospel of mineralogy" for such a long time and so effectively.

Junius J. Hayes, Pres.,
Mineralogical Society of Utah
Salt Lake City, Utah

Feb. 8th, 1944.

Editor R & M:

Allow me to correct your answer to A. S. on page 49 of the last issue of ROCKS AND MINERALS.

A. S. was quite correct and also you are quite correct and still both are wrong. The term "marble" is used in two senses, one the scientific and the other the trade. In the geological sense marble is a crystalline limestone. As a trade name it applies to a carbonate rock which will take a polish.

R. J. Holden,
Professor of Geology
Virginia Polytechnic Institute

Back the Attack with War Bonds & Stamps

ROCKS and MINERALS

PUBLISHED MONTHLY

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March 1944

Vol. 19, No. 3

The Official Journal of the ROCKS and MINERALS ASSOCIATION

Whole No. 152

TANTALITE

Brazil's Mineral Plays Vital Role in United Nations War Effort

PARELHAS, BRAZIL—Deep in this barren interior of northeastern Brazil, Americans and Brazilians are waging a hide-and-seek battle with nature to find and mine tantalite, the new black gold of the United Nations' war effort.

Few people possibly have heard of tantalite, yet this rare pitch-black mineral ranks as one of the most important resources in the whole Allied war chest. The reason is this: tantalum, the metal derived from tantalite, gives added power and range to United States and United Nations war weapons.

While tantalite's exact military uses are military secrets, an idea of the heavy wartime demand for the mineral can be gleaned from its air priority. Of all the strategic materials rushed by air to the United States from Brazil and other nations, tantalite alone holds down the top rating: A-1-A. The United Nations want all the tantalite they can get and they want it fast.

But producing 52 per cent of the world's highest-grade tantalite here is far from easy, as Brazilians and Americans toiling in the torrid sun of Brazil's bleak "sertao" (interior) have found out. Biggest problem of all is locating the black substance in this huge, mountainous area, stretching in a wide arc of 3,600 square miles through the states of Paraiba and Rio Grande do Norte.

Mining men compare the tantalite operation to the proverbial "looking for a needle in a haystack"—and it isn't hard to see why. Tantalite ore usually is found clustered with other minerals in towering, odd-shaped rock formations called pegmatite dikes. Or it may be found in alluvial deposits beneath the level valley land. But the problem comes in determining which of the thousands of dikes and deposits in the region contain sufficient tantalite to warrant a big, costly mining effort.

Frequently, a likely-looking lode will yield a few pounds of high-grade ore, then peter out. An obscure mine, on the other hand, might suddenly turn into a rich source with a plentiful supply. And even tantalite ore itself is hard to distinguish from other minerals with similar characteristics. At best it's a touch-and-go business with Dame Nature seemingly intent on leading the tantalite hunters a merry chase.

This battle of man versus nature is being fought on a battleground that closely resembles North America's semi-arid Southwest: rainless, thin-grassed back country of granite-faced mountains and occasional spiny cactus plants. Nature is slowly losing the battle; tantalite production has zoomed 140 per cent over last year, and next year's output is expected to double this year's. But actual production figures seem infinitesimal in a world at war accustomed to count in hundreds of thousands, millions, billions.

Indeed, the most amazing thing about tantalite is the small, though priceless, amount of product resulting from an incredible amount of work. As one operator put it: "We're pouring out gallons to get a drop." Here are some figures which point out the complexity of the tantalite business:

An estimated 3,000 tons of rock must be mined to get one ton of tantalite, and it takes one man 130 days to crush, wash and prepare a ton of the ore for shipment. This becomes even more remarkable when it is realized that tantalite mining, despite the recent arrival of American mechanical equipment, is still basically a hand-picking and hand-washing operation.

Sweating with pick and shovel in the tropical sun, about 8,000 Brazilian laborers are moving broken rock and working subsurface deposits to extract the vital resource for the United Nations. These men form the tantalite army which moves into areas surveyed and checked by its officers, the Brazilian and American Government engineers. Altogether some 400 mines are being operated, all by private prospectors and companies that sell the tantalite to exporters—the middle men—who, in turn, sell the bagged, graded mineral to the United States Government.

The American Government's role in tantalite production is one of buying, financing, and supplying technical assistance. By an agreement with the Brazilian Government, the United States Purchasing Commission, now a part of Leo Crowley's Foreign Economic Administration, buys all of Brazil's tantalite output, loans money to private producers to stimulate development and swift exploitation of mines.

For its part, the Brazilian Government has assigned technicians to work with the American engineers in speeding up tantalite production. In 1940, before the current rush for the mineral began, Brazil's National Department of Mineral Production built a chemical laboratory at Campina Grande, about 100 miles from here, to analyze and grade the ore. This lab has proved invaluable in locating high-grade tantalite deposits.

Fundamental in any tantalite discussion is this one fact: Brazilian-American cooperation today is augmenting the Allied supply of one of the world's most prized materials and, at the same time, is denying it to our German and Japanese foes. The latter is very significant, for Axis agents two years ago were busy in this area buying up all the coal-like minerals they could lay their hands on.

Fortunately for the Allies, Brazil's tantalite production was very low during the two years of feverish Axis activity here. Thus, while some tantalite fell into enemy hands, the amount was al-

Cans of water being carried by burros to a tantalite mine in the desolate interior of Northern Brazil. This is a small placer mine using crude methods.

most negligible; and after Pearl Harbor Brazil's door was slammed shut to further Axis purchases. Mining men now say that Hitler and Tojo would give almost anything to get some tantalite for their war plants.

Tantalite mining is an expensive proposition. While labor is fantastically cheap (most unskilled workers earn around 30 cents a day), the average producer finds it tough to make ends meet, owing to the small quantity of tantalite which he is likely to mine after an extremely laborious effort. As a consequence, producers turn increasingly to simpler and far more profitable operations in scheelite mining, and the USPC is had-pressed to check this trend.

Many Brazilians here feel that the tantalite business is a war bubble that will soon burst, and they don't want to be caught short. But the USPC men have effectively counteracted this belief by easing the mine owners' financial burden through loans and higher prices, and by pointing out the fabulous peacetime future which tantalite appears to have in the field of electronics.

The USPC's tantalite program didn't get into full swing until last February, after a preliminary geological survey in the summer of 1942 had shown the wisdom of a large-scale mining effort in this area. Brazil's ore, running better than 45 per cent pure tantalite, was found to exceed by far the quality and more than equal the quantity of the ore mined in Australia and South Africa, the other two major sources of tantalite. Some prospectors around here have been pecking away at tantalile mining since 1927, and the industry took form in 1937; but it took the war and the pressing military need for the mineral to set this area booming.

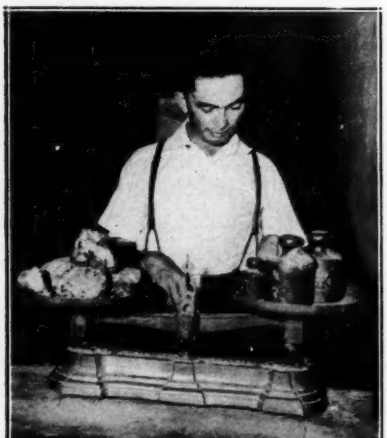
Communications to the tantalite mines, sprawling over vast distances, has been a huge problem. The old sandy roads

Workmen re-washing tantalite at the headquarters of the world's largest producers of the mineral in Northern Brazil.

twisting over mountains and across valleys were inadequate to handle truck traffic and they had to be improved. The USPC alone added about 65 miles of new country-type roadway, and is building more. And it is interesting to watch the curious expressions on the faces of the Brazilian country folk, many of whom are seeing their first "jeeps" bouncing along the roads.

Mechanization of tantalite work has been slow. Machines are something brand-new to these Brazilian miners who have traditionally worked with the most primitive tools. And it very naturally takes some time for them to learn. But, as compressors and jack-hammers and other equipment gradually reach here from the United States, the Brazilians will gain valuable experience which will stand them in good stead after the war.

United States Government agencies are bringing down about $250,000 worth of mining equipment, including a large crusher and rolls. These mechanical tools are being leased to the Brazilian producers at low cost. Before the present up-surge in mining activity here, the Brazilians had never used this expensive equipment, because they couldn't afford it.



A tantalite buyer shown balancing the mineral on his scales. The price of this rare mineral needed for war use runs over $6,000 per ton.

Today, the mining men here generally are still using old-fashioned hand washing to recover tantalite. They set up wooden sluice boxes near subsurface deposits, dig holes to care for water, which is usually carried in gasoline cans by long-eared burros from streams sometimes miles away. The rock and dirt are broken, screened and then washed in the water box. Tantalite, being heavy, sinks to the bottom of the box while the dirt drains off. The precious overflow water is then collected and used again.

The Brazilian miners live near their work, far from the comforts of even the small Brazilian interior towns. Most of them have thrown up thatched-roofed lean-tos next to their excavations, sleeping ten or more men in hammocks strung diagonally across the inside. Outside, one is almost certain to see big steaming pots of "feijao" (the Brazilian rice-and-beans dish). Life is dull here because there is little to do to break the monotony.

Once or twice a week the miners gather together their tantalite ore, pack it on burro-back, and set off for the nearest town, where dealers weigh the mineral, judge its quality. These dealers, in turn, ship the ore by truck to Campina Grande where it is graded, washed, sun-dried and bagged. The last step in the tantalite cycle in Brazil takes place at Natal's great Parnamirim air field, where the tantalite is loaded aboard American military transports and rushed to the United States.

That's the story of tantalite, a story of a little-known battle on the Brazilian economic front. While the United Nations' armies smash ahead toward Victory, a small group of miners, geologists and engineers in Brazil are fighting to get one of the war's prime sinews to help those armies achieve their goal.

MAGNET COVE AND LODESTONE

By H. E. WHEELER

Magnet Cove is located in Hot Springs County, Arkansas, approximately 15 miles East of Hot Springs and fifty miles South of Little Rock. The "Cove" is an elliptical bowl about three and one half miles across from East to West, and two and a half miles from North to South. It contains about 1,000 acres of generally very fertile land. The surrounding ridge has an almost unbroken chain of coniferous (pine) trees making its outline conspicuous in winter since the trees within the Cove are altogether of deciduous character. The highest point in the rim is 200 feet above the level of the creek that flows through the Cove into Ouachita River on the South.

The term "Cove" may be a bit puzzling to those who think of coves as bays in relation to water, either river, lake or sea, but in the Southern Appalachians—Virginia, Tennessee, and Alabama—and in this particular case in Arkansas, coves are understood to be depressed bowls or fore-shortened valleys lying within the embrace of more or less parallel mountains. We have such localities as Cade's Cove, in Tennessee, Sharp's Cove, in Alabama, and many others that are generally habitats of prolific molluscan life or botanical rarities.

De Soto May Have Been the First White Man to Visit Magnet Cove

Here is an interesting historical note which may have a bearing on the geology of the region. In 1551 De Soto passed through central Arkansas. In one of the only three narratives recording the expedition, which was written by a Portuguese adventurer, who signs himself "A Gentleman of Elvira", mention is made of the arrival of the party at a lake of brackish water which was hot and swelled the bellies of the horses that drank from it. Some historians have tried to identify this "lake" as being originally at Hot Springs, Arkansas, but the physical situation there does not make this identification plausible. Within the memory of the oldest inhabitants there was on the east side of Cove Creek, and north of the present highway that crosses the Cove from East to West, a swamp surrounded by a cane brake. In the center of this swamp was a pond about three acres in extent. The water in the pond was always warm, and never froze in winter as the creek sometimes did. That it could have been of much larger extent, and that it might have been a hot lake, seems possible from the physical character of the area and the deposits of calcareous and silicious tufa which such a lake might have precipitated. Though the pond is now nonexistent and even the original swamp vegetation has wholly disappeared the name "Cove" may have been suggested by the situation as it once was. Was it here that De Soto's horses got in trouble?

Note. Henry R. Schoolcraft, in his report on the Lead Mines of Missouri, etc., written in 1819, seems to have been the first author to use the word Cove for this region; and Fetherstonhaugh, writing in 1835, employed the name "Magnet Cove", so that the fuller name must have come into use between these dates.

The Kimzeys—Pioneer Mineralogists of Magnet Cove

In Dr. Francis Williams' classic report on the Igneous Rocks of Arkansas[1] frequent mention is made of the assistance of Mr. W. J. Kimzey, a pioneer citizen and a native genius in his understanding of the rocks and minerals of Magnet Cove.[2] Mr. Kimzey was the father of the present State Geologist of Arkansas, Mr. Joe W. Kimzey, and it would seem that a mineralogical bent was the inheritance of all the sons and grandsons of this versatile field collector. The writer of this article knew him well and kept up a delightful correspondence with him. Some of the finest specimens in his collection were trophies of his keen

1 The Igneous Rocks of Arkansas, J. Francis Williams, Annual Report, Geological Survey of Arkansas, Vol. II, 1890.

2 *Ibid,* pp. 184, 242, 322, 338.

eyesight and indefatigable industry.

In those pioneer days Magnet Cove was a source of revenue for the Kimzey family who established profitable contacts with mineral dealers and visiting geologists, Tradition has it that many famous specimens found their way to Eastern museums and more often to European collectors. One of the famous mineralogical museums of Germany is said to have assigned an entire room to the interests of Magnet Cove, and the Kimzey boys were employed for several months as helpers for a German mineralogist who collected with painstaking thoroughness and in prodigious quantity. No American museum has ever featured this famous locality with any such comprehensiveness though the Arkansas Geological Survey contemplates the development of a Magnet Cove room with habitat groups of commanding proportion and a full quota of its petrographical and mineralogical treasures in the display.

Lodestone in Magnet Cove

Recently I came across an interesting story of those early collecting days at Magnet Cove which is perhaps worth passing on. Mineral dealers have always sought to increase their stocks by securing saleable specimens in bulk, but Magnet Cove minerals are, for the most part, too rare to satisfy that specification. Lodestone, however, is an exception. And so it happened that the Kimzey boys would often receive orders for this perennially popular mineral in quantites of 50, 100, or even 500 pound lots. Such orders specified that that the material should be graded by its ability to support 4-penny, 6-penny, 10-penny, 20-penny nails, and rail road spikes. The boys learned that these "grades" could be almost as accurately determined by the fuzziness of the lodestones raked over the ground with an ordinary garden rake. And so they could dispense with the nail tests and save time. The more strongly polarized pieces naturally brought a fancier price, but not many "spike grade" specimens were ever found.

It is well known that lodestone, at least that found at Magnet Cove, is invariably confined to the surface. Nor does non-magnetic magnetite acquire polarity by lying in contact with other polarized pieces. Whatever the explanation of its acquirement of magnetic character it seems in some way to require an atmospheric environment. Not a single specimen of polarized magnetite has ever been dug from more than a few feet below the surface. However the material with a consistent high iron content continues down to undetermined depth. No exhibit secures more attention than a specimen of strongly polarized lodestone suspended to show its polarity and from which dangles a necklace of nails and odds and ends of iron.

Magnet Cove continues to furnish specimens though they are not nearly so plentiful as formerly. At the present time the magnetite is being mined commercially and from beneath the surface occur types of magnetite which have a very smooth and steel-like luster.

There are various theories as to the explanation of the magnetic properties of the elements and minerals. Since Faraday's day the elements have been divided into two classes depending upon the fact that in one class when a small rod of the metal is suspended between the poles of a magnet it assumes a position in a line parallel to one joining the poles of a magnet; in the other class such a rod takes a position at right angles to a line connecting the poles.

The first group in which such metallic elements as iron, cobalt, nickel, and titanium fall, is called *paramagnetic*; the second group, in which such metals as copper, silver, gold, zinc, and lead belong, is called *diamagnetic*. There seems to be no connection between the chemical and magnetic properties of these elements. However, if all kinds of matter are in greater or lesser degree magnetic, it must follow that their atoms are magnetic, or that magnetism may be considered an inherent property of the atoms themselves.

Magnetic iron may be, on the hypothesis of some physicists, a molecular rather than an atomic phenomenon, though some of the compounds of iron are definitely paramagnetic while other compounds are diamagnetic. If we suppose that the molecules of all the elements are themselves magnets but oriented in every direction in massive association or chemical (mineral) compounds, then such specimens would exhibit no polarism; but if such masses are acted upon by a magnetic force and its molecules drawn in one axial direction the material would be polarized. Should this polarizing agent leave the molecules so oriented they would be permanently magnetized, but if, on the release of magnetic influences, they should return to their original position, the material would cease to be perceptibly magnetic. The writer may be permitted to say that he does not believe that this interpretation is by any means final, for students of the structure of matter have many challenging situations which have to do with the origin of inherent or derivative properties.

Some Minerals Discovered by the Kimzeys

To Mr. W. J. Kimzey, father of the present State Geologist of Arkansas, is due the honor of discovering the rare mineral monticellite which occurs in a beautiful calcite associated with dysanalyte and magnetite. The latter minerals are in small well developed crystals but the monticellite is generally in granular or massive form, yellow-brown in color, but rarely as measurable crystals.

It will be impossible to tell here the glamorous story of the more than seventy-five distinct contact minerals which have been listed from the Cove, but it might be interesting to note one or two of the more recent finds. Mr. Lawton Kimzey, the youngest son of the pioneer whose memory we honor, has located a formation of smoky quartz, for the most part in phantom type, in which is included needles of a glistening white mineral not yet satisfactorily identified. It is one of the most beautiful of all the Magnet Cove minerals.

Dr. Hugh Miser, of the United States Geological Survey, has identified the rare lithium-mica taeniolite,[3] first described from Greenland, in Magnet Cove. This mineral was first discovered by Mr. Lawton Kimzey. It is unique among the micas on account of the replacement of aluminum by lithium and magnesium, and by having a beautifully silky luster.

Some rarities of Magnet Cove

The possibilities of the Cove have never been exhausted. The collector who wants rarities may look to Magnet Cove to supply a large number of them, such as the beautiful peach-bloom eudialyte and its rarer alteration associate, eucolite. He may look long and patiently for perfect 8-ling rosettes of rutile, and still longer for the 6-lings. Nothing is more appealing to a crystallographer than a series of the many types of brookite and the paramorphous forms of rutile after brookite. Then add a tray of dysanalyte with the closely related perofskite, put in a specimen of nepheline-syenite with imbedded manganopectolite, and finally a showy specimen of pegmatite in which may be included terminated crystals of aegirite and the rarer acmite, as well as albite, eudialyte, and even titanite—all in the same specimen. How a petrologist revels in the many types of rare rocks which the Cove affords, igneous rocks that have lured many geologists to the Cove and left them guessing still. There are syenites such as elaeolite syenite, biotite syenite, leucite syenite, nepheline syenite, the ijolites, tinguaites, and the vari-colored novaculites quarried by the aborigines and still available for decorative work.

But do not visit Magnet Cove with the expectation that you can do it justice in half a day. The more often you come, and the longer you stay, and the more patiently you explore, the greater will be your reward.

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3 Taeniolite from Magnet Cove, H. D. Miser and R. E. Stevens, *American Mineralogist*. Vol. 23, No. 2, Feb. 1938, pp. 104-108.

HOW WOULD YOU LIKE A 600 POUND CRYSTAL FOR YOUR GEM COLLECTION?

By T. ORCHARD LISLE

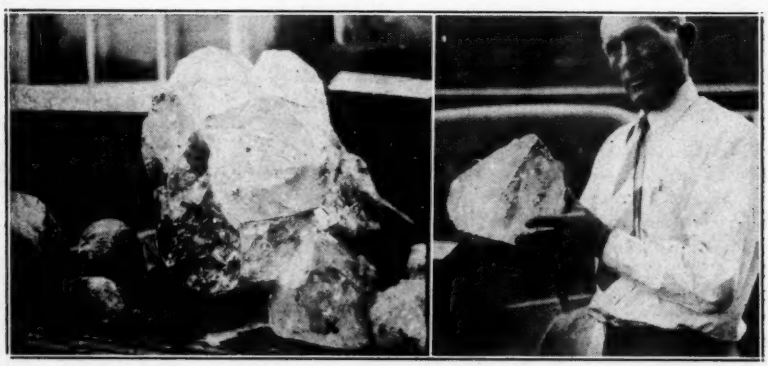
History is repeating itself! During the last great world war the demand for high grade quartz crystals was considerable, and some very valuable gems of large size were found in the Green Mountain Mine, Chilli Gulch, Calaveras County, California. They were noted for their high quality as well as size, and a magnificent crystal ball is still to be seen at the American Museum of Natural History, New York City.

After having laid dormant and partially caved in for over twenty years, the mine, or rather tunnel into the hillside, has been reopened and renamed the Calaveras Crystal mine, and already some fine crystals have been dug out of the closely-packed gravel.

Two years ago I visited the property, which is located on the McSorley ranch near Mokelumne Hill in the Mother Lode country, hoping to find a few stray crystals on the dump. But, I could see no traces of the mine entrance and but a very small dump, the rest of the mine waste having long grown over. Nary a trace of a crystal, nor even a chip did I find, although when the present operators ran a bulldoser through the dump they picked up some nice specimens weighing half-a-dozen pounds and more each. In the gold rush days when the mine was worked for that precious yellow metal, the miners threw away the quartz crystals as there was then no market for them.

Less than a year ago Nick Belum, Fay Zinck, and John Revenda, Stockton contractors, decided on a "flutter" at the old mine and leased the property from R.P.M. Davis, of Los Angeles, who had bought the rights from McSorley. They put in some equipment and set four miners working under the direction of Mervin Porteous, superintendent. The old tunnel was cleared for about 600 ft. and then driven further in. After about three months work they dug out a fine 87 lb. crystal, which I photographed on the occasion of another visit. It was sent to the stockpile at Washington, D. C., and brought about $1,200.

Early in November I received a special delivery letter from Porteous saying —"We've found a big one—come along with your camera!" It certainly was a



Crystals, including one of 610 lbs., recently found at the Calaveras Crystal Mine in California. The "small" crystal marked X is being held by Nick Belum, and from this the comparative size of the big crystal can be appreciated.

big fellow, and beautifully clear except for some phantoms here and there. Believe it or not, it weighed 610 lbs. and had five terminations. It is really five large crystals welded by nature into one, so doubtless can be cleaved to render it a more suitable size for diamond sawing for instrument and radio purposes. As will be seen from the photograph several other substantially sized crystals were also found. The surfaces are, of course, badly scratched by the millions of years contact with the large gravel stones in which they are virtually cemented under pressure; but inside they are a joy to behold. In my private mineral collection there now repose several fractured pieces of crystal from this mine. Thus has history repeated itself during this second great world war.

After the war I should not be surprised if the mine was once more closed, in which case my rock-hunting brothers may like to know that the mine is located about 500 yards off the main highway 49 from San Andreas to Jackson, about two miles before you come to Mokelumne Hill. Doubtless the operators will leave some chips on the dumps, clear enough to gladden the heart of rough gem collectors.

A stone's throw away another crystal mine has been opened, known as the Rough Diamond Crystal Mine. The operators have found some good crystals, including a beauty of 250 lbs.

The largest quartz crystal of gem quality ever found at the old Green Mountain mine was a six-footer weighing 2,800 lbs. In the old days altogether 22 tons of crystals were produced and shipped, including many to Tiffanys of New York. One sphere when cut had a diameter of 14 inches.

SATIN SPAR FROM BURNTFORK, WYO.

By RUEL B. TRIPLETT

Very fine lustrous masses of satin spar (gypsum) equal to any seen from England, was found by the writer at Burntfork, Wyo., about 12 years ago. The mineral of course is very soft, as is all gypsum, but it takes a good polish and makes very beautiful cabochons.

Location

Burntfork is in the extreme southwestern corner of Sweetwater County (not far from the Utah line) in southwestern Wyoming. It is on the south bank of Henrys Fork. Since the find was made, the post office at Burntfork (a very small hamlet) has been discontinued or rather consolidated with McKinnon, 5 miles to the east. Burntfork received its name from a nearby stream of that name.

The satin spar was found on the west end of Cedar Mountain in Burntfork.

Geology

The formation in which the satin spar occurs consists of clay and limestone and is locally known as "Bad Lands". Swallow-tail crystals of selenite (gypsum) and aragonite occur with the satin spar.

The satin spar, with which is associated the aragonite, was found in a vein 3 feet wide and 5½ inches deep. This vein ran into the hill for 3 or 4 feet and then pinched out and I have not been able to find another deposit of similar quality satin spar although there is much gypsum in the area that is fibrous and has a vitreous luster but it is very coarse.

The satin spar came out in pieces weighing from 2 to 6 lbs., the outside of which was dull but when broken open revealed the most lustrous, very fine silky, fibrous satin spar imaginable.

The aragonite is short fibered and of poor quality. The swallow-tail selenite crystals are quite good—some being more than a foot long—but weathered on the outside.

There are no mines or quarries at the site nor in the area and the occurrence is an original find of mine.

MANGANESE DEPOSITS OF NIKOPOL, RUSSIA

A staggering blow was given to Germany's steel industry when on Mon., Feb. 7, 1944, Nikopol was recaptured by Russian troops. Nikopol is the manganese center of the world and the ore from its mines was of such vital importance in the manufacture of Germany's guns and other war equipment that Hitler ordered his troops to hold the mines at all cost. Thousands of Nazi soldiers were killed in defending Nikopol—in fact it was the last German stronghold on the east bank of the Dnieper River to fall. The loss of Nikopol's manganese mines will seriously cripple the German army.

Location

The Nikopol manganese district is situated on the right bank of the Dnieper River, below the city of Zaporozhie, in the southern part of the Ukraine Province, in southwestern Russia. Zaporozhie is a city of 60,000 located about 90 miles northwest of the Sea of Azov. The Nikopol district is also known as being north of the Black Sea in reference to another famous manganese district, the Tchiaturi, which is east of the Black Sea.

History

The largest deposits of manganese ore in the world are in Russia. For many years the mines in the Caucausus Mountains, in southern Russia, (at Tchiaturi in the northwestern part of Georgia Province), had the largest output but during the past few years, prior to the war, the Nikopol mines forged to the front. It is to be assumed that while under Nazi control the Nikopol mines were worked day and night and huge tonnages shipped to Germany—in time this huge tonnage will be exhausted and then the Nazi war machine will begin to crumble.

Manganese is a metal used in the hardening of steel. It is a strategic metal of such vital military importance that it is no wonder Nikopol has featured so prominently, lately, in the news.

Geology

The Nikopol district is divided into eastern and western sections by a zone of crystalline rocks barren of ore. The western section is about 12x6 miles in area. The eastern section is made up of 5 small districts totalling about 12 sq. miles in area.

The manganese ore body is a bed or stratum that lies between clays and sandstone of Oligocene age. The deposit varies in thickness from 3 to 12 feet and extends to 300 feet in depth.

The surface of the ore body is composed of a black earthy material from 3 to 7 feet in width; underneath this is a one foot bed of black clay lying on top of a 3 foot bed of plastic clay. Next comes the ore body consisting of nodules of manganese embedded in argillaceous and calcareous clays. The ore body rests on granite. The ore is chiefly pyrolusite (a soft, friable, black manganese oxide) with small amounts of wad and psilomelane. Wad is a very soft, black hydrous manganese oxide while psilomelane is a very hard, black hydrous manganese oxide.

The deposits are mined by shafts from 50 to 300 feet deep that have been sunk to the granite.

Literature

Mineral Resources of the United States, 1927. Part 1. Metals. Bureau of Mines, Washington, D. C., 1930. p. 194.

The Iron and Steel Industries of Europe. By Charles Will Wright. Bureau of Mines, Washington, D. C., 1939, p. 61.

FAMOUS COPPER MINES AT FALUN, SWEDEN

Falun, or Fahlun is a small city in south-central Sweden, on the north end of Lake Runn. Here are some of the world's greatest copper mines which have been worked from 1300 to the present time. The chief ore is chalcopyrite with which is associated pyrite and pyrrhotite.

Many minerals are found in the mines at Falun among which are allanite, andalusite, bismuth, bornite, botryogen, chalcanthite, chalcopyrite, gahnite, galenobismutite, garnet, goslarite, iolite, magnetite, melanterite, muscovite, platynite, pyrite, pyrrhotite, serpentine, and tetrahedrite.

Club and Society Notes

NOTES ON THE ACTIVITIES OF THE SOUTHWEST MINERALOGISTS

We have adopted a policy of having a short lecture following our business meeting the first Friday of each month, to replace the study class on the second Friday. This makes it possible for more members to benefit by killing two birds with one gallon of gasoline, so to speak. Our November shortie was presented by John Akers on "lead" and was one of a series planned by Mr. Akers. The December subject being "Zinc" and the January topic will be "Chromium". These are very timely and of intense interest to us all in these war production days.

Our regular program and social nite in November which came on the 19th was highlighted by a very instructive talk on "Synthetic Rubber" presented by Mr. J. A. Detweiler of the Standard Oil Company.

The field trip for November was sponsored by Ruth and Frank Stillwell and was a visit to the home of Mr. and Mrs. L. R. Gully in Venice, Calif. The Gullys are true hobbyists and gracious hosts and a most enjoyable afternoon was had.

Nettie and Albert Hake were co-chairmen for the month of December and sponsored the Christmas Party at which an exchange of gifts and a grab bag were greatly enjoyed. Mr. Hake donated all the specimens for the grab bag and turned over a very neat sum to the treasury. Mrs. Hake baked apple pies and apple pies and apple pies, and these were served with ice cream and coffee while a four piece dance band supplied background music to the Ohs and Ahs as specimens were inspected and admired.

A pot luck dinner was served at the home of Mr. and Mrs. Hake on Sunday the 19th and in lieu of a field trip the members had the privilege of inspecting the hundreds and hundreds of cabochons, slabs, crystals and mineral specimens that make Mr. Hake's collection one of the outstanding in the West.

You can easily see that we are carrying on in spite of war or gas and tire shortages and are enjoying some of the "close to home" things that we would be overlooking if trips to distant spots were possible. However, we are all looking forward to the time when we can again crawl out of a sleeping bag and cook non-redpoint bacon on our Coleman stoves, burning non-rationed gasoline, to begin another day of sheer delight searching for that elusive specimen which is just over the next hill.

We are going to present our annual show on Saturday and Sunday, April 1st and 2nd, and hope to meet all our old friends and make many new ones.

Dorothy C. Craig,
Corres. Sec'y.
(Los Angeles, Calif.)

SAN JOSE CHAPTER OF THE ROCKS AND MINERALS ASSOCIATION

On. Nov. 12th met at home of Mr. and Mrs. Stanley Armstrong. Twenty members were present at a delightful buffet supper and to hear an instructive talk by Mr. Armstrong on the gem rocks of the Pacific Northwest, principally of Oregon.

His very fine collection of polished beach agates and petrified wood was very interesting and greatly enjoyed.

On Nov. 26th the meeting was held in the Science Building at Rosicrucian Park where a beautiful display of fluorescent minerals was enjoyed under the large mercury vapor lamp which is a fixture in the demonstration hall.

On Dec. 10th met at the home of Mr. and Mrs. T. F. Rogers where 21 rockhounds gave out many Oh's and Ah's in viewing the beautiful collection Mr. Rogers had spread out on display. Featuring many local specimens, the Rogers proved to those present that it is not necessary to go long distances to get wonder material. After refreshments were served, an interesting talk was given by one of the visitors, Mr. Wm. Buhn of Oakland, on the variety and extent of the minerals near Riverside, Calif., where he had been in training in the Armed services.

On Jan. 14th a very interesting and instructive talk was given by our President, Mr. H. C. Amens, on the subject of Jasper, after which some very nice specimens were given to all present.

Meeting was held in the Science Hall at Rosicrucian Park, San Jose, Calif.

On Jan. 28th the meeting was again held in the Science Hall and a continuation of the last subject was given by Mr. Amens with the added subject of the hardness and specific gravity with demonstrations and instructive discussions carried on.

Wm. C. Chandler.

New York Mineralogical Club

American Museum of Natural History, New York, N. Y., Wednesday, Nov. 17, 1943. Convened: 8:05 P.M. Attendance: 35.

The president opened the meeting with the announcement that the following new members had been elected:

Mr. Fred W. Cassirer
Mrs. R. M. Gunnison
Mr. Alvin A. Hufnagel
Mr. Anthony J. Kunickis
Mr. Ewald Leyendecker

Mr. Stanton, on behalf of Mr. James G. Manchester, presented to the club a scrap book of photographs recording the early activities of the club. The gift was welcomed as a valuable addition to our historical records and a motion to thank Mr. Manchester was unanimously passed.

Attention was called to a posted list of minerals and localities reported at the previous meeting and members were asked to give the secretary a detailed written memorandum of any localities reported at future meetings so that such lists might be posted from time to time for the benefit of those interested.

Dr. William A. Mudge of the International Nickel Company spoke briefly on the early history of the nickel industry and described a few of the 8,550 alloys of nickel. Of these, 6,250 contain less than 1% nickel, which nevertheless has a marked influence on the properties of the alloy, especially on its texture.

In discussing the successive development of the Norwegian, New Caledonian, and Sudbury deposits, Dr. Mudge emphasized that the sulfide ores of nickel occur in cold climates, while the silicate nickel ores occur in warm climates.

Dr. Mudge's introductory talk was followed by a sound film, showing the mining, crushing, refining, and processing of nickel and copper by the International Nickel Company.

The meeting was adjourned at 9:50.

Elizabeth Armstrong, Secretary.

Meeting of December 15, 1943.

Convened: 8 P.M. Attendance: 35.

The president opened the meeting with a letter of greeting from Dr. Pough in Brazil and announced that members of the Arizona Mineral Society wanted to exchange specimens with members of the New York Mineralogical Club. Those interested should communicate with A. L. Flagg, P. O. Box 2345, Phoenix, Arizona.

Mr. Trainer brought an attractive set of duplicate specimens from his collection for any of the club members who wished to take them.

Mr. Jay T. Fox addressed the meeting on "Photographing Your Minerals in Color", illustrating the lecture with excellent color slides of his own making. Although Kodachrome, according to Mr. Fox, gives the best color reproduction of any film now available, a better, cheaper color film, now exclusively for Navy use, will be on the market after the war.

The advantages of Kodachrome over black and white for giant enlargements were explained and the necessity for precision of exposure time and rigidity of equipment was emphasized.

Among the color photographs projected were photomicrographs of micromounts, pictures of photographic equipment, minerals, gem-stones, flowers, birds, and insects.

The meeting was adjourned at 9:45.

E. Lawrence Sampter,
Secretary pro tem.

WORLD'S FINEST PROUSTITES COME FROM CHILE

Magnificent groups of transparent ruby-red crystals of proustite, the finest known in the world, are found in the rich silver mines at Chanarcillo, in the arid region of central Chile. Some of these groups are considered by mineralogists to be among the most beautiful examples known of mineral crystallizations. Proustite is a sulphide of arsenic and silver and specimens of this beautiful mineral from Chanarcillo are to be found in all prominent museums and in many private collections.

At Chanarcillo, proustite, whose individual crystals are as much as three inches in length, is associated with argentite, pyrargyrite, sanguinite, and other minerals. Sometimes the mineral is found coated with a white asbestos which can easily be removed leaving exposed beautiful crystal faces of the proustite.

Proustite is a soft mineral with a brilliant adamantine luster when fresh but becomes dull when exposed to bright sunlight for any length of time. For this reason good specimens should always be kept covered and not handled too much.

THE AMATEUR LAPIDARY

CUTTING GEMS BY HAND

By C. C. CURTIS AND J. H. HOWARD

PART 2

Smooth Grinding the Base

In a similar pan use a mix of No. FF carborundum grains made as before with earth and water. Grind until sure that cutting is as deep as any pits left by the coarser grains. It is very important that the stone and the cement and the stick and the worker's hands be washed free of all coarse grains before beginning this operation.

Alternate method; rub, wet, on fine carborundum grinding wheel or fine carborundum scythe sharpener. Comments same as on coarse grinding.

Coarse Sanding of Base

When it is sure all pits left by the coarse grind have been removed by the fine grind, the base is ready for coarse sanding. Attach a piece of soft leather such as calfskin, about 4″ by 8″, to a wood block ¾″ by 4″ by 12″, using thumb tacks. Wet the leather. Lay on it a piece of approx. No. 280 carborundum cloth. Wet the cloth. Proceed to rub until no further improvement is noted. This operation must remove all pits and scratches left by the fine grinding. If the surface tends to be too much rounded, lay the cloth on a flat wood block instead of on the leather pad.

Alternate; rub in a mud of No. FF grains such as was used for fine grinding, spread on a hardwood block. Rubbing across grain is better than lengthwise with the grain. This seems to be better and faster on some stones such as agate that is uniform in hardness. It is not as good as the cloth on stones that are a mixture of materials of varying hardness as the loose grains will undercut the softer materials. When this scheme is used the stone is taken directly from this operation to the final polish. But if the cloth scheme is used, the No. 280 cloth must be followed by a smooth sanding.

Smooth Sanding of Base

Prepare another wood block with leather pad as was used in coarse sanding. Use No. 400 Carborundum cloth or paper, wet. If the coarse sanding was done on a leather pad, the pad scheme may be and should be used in this operation, but if the No. 280 cloth was used directly on a wood board, the No. 400 must be used the same way. Continue this sanding until no scratches are visible.

Polishing the Base

Mount a piece of soft tough leather 4″ by 8″ on a wood block ¾″ by 4″ by 12″. Wet the leather thoroly. Daub with a paste of tin oxide and water the consistency of cream. Rub until polished, adding paste frequently and keeping wet.

Alternate method: some stones seem to take a better polish more easily if the tin oxide paste is used on a piece of optician's felt.

Again: sometimes if a stone will not take a good polish on either the leather or the felt wet, it will work nicely if the felt is left dry and the dry tin oxide is sprinkled on it plentifully.

Removing the Stone From the Stick

The best way to do this is dependent on both the cement used and the nature of the stone. If ordinary chasers cement is used and the stone is tough and free from flaws, it can be readily removed by merely pressing the blade of a knife between the cement and the stone. But under this treatment, if the stone has a weak spot, it may break in two. The safest way is to warm the stone and the cement with the alcohol lamp and work the knife blade gradually between them until the stone comes loose. This will leave some cement on the stone. This cement can be removed by soaking several minutes in alcohol or several seconds in acetone.

Re-cementing For Working Front of Stone

The method of attaching is the same as was used for cementing on the short pyramidal stick for working the back. But this stick should be about 6" long and square or rectangular. Having the stick this shape instead of round helps greatly to identify the positions of the stone and helps the operator to work with greater certainty on any specific part of the stone.

Shaping the Front

This is done in the pan that was used for rough grinding the base. But now instead of merely rubbing an established approximate flat, the stone must be turned and worked into the desired symmetry. Add mud frequently. Use heavy pressure. First grind the sides of the stones to the final outline at the base. Be sure to give enough bevel to the sides of the stone where they join the base that the stone can be held tight in a mounting if desired. After the base outline and the bevel are established, round off the top. When it is certain that the desired shape and size are reached, proceed to the next step.

(To be continued)

With Our Dealers

Chas. O. Fernquist, of Spokane, Wash., has bought the stocks of two dealers—the Mineral Supply House, of Spokane, Wash., and Hatfield Goudey, of Yerington, Nev. His own large stock has now been greatly increased and he is ready to serve you. Gems-crystals-crystallized minerals-Chinese carvings-books—he has them all. Send in your orders today!

Ward's Natural Science Est., Inc., Rochester, N. Y., have set aside a selection of choice specimens which are reserved for orders received from their advertisement in ROCKS AND MINERALS. Collectors will appreciate this service and the specimens will all be bought in a hurry. Don't wait for tomorrow to send in an order—do it today as tomorrow will be too late!

Tantalite, rose-red muscovite, and Iceland spar—three very interesting minerals from Taos, Taos County, N. Mex.—are offered collectors this month by Schortmann's Minerals, of Easthampton, Mass.

In this issue Lee Filer, of Central Valley, N. Y., is offering four different specimens from the famous Tilly Foster mine at $1 per set. You better order one or two sets!

Each Saw Order is a personal job with us! This is the slogan of Wilfred C. Eyles, of Bayfield, Colo. Read his ad in this issue to learn how his saws stand up in operation!

At last you can buy a heart—a gorgeous one, too—and for only a few dollars. Warner and Grieger, of Pasadena, Calif., has a large stock of them, of all colors and varieties. Have a heart and buy one!

A new advertiser appears in this issue. He is Geo. W. Chambers, of Pasadena, Calif., whose store is known as The Desert Rat's Nest. One specimen offered for sale is a beautiful Australian Black Opal, 146 carats, for $146.00.

World's Minerals, of Oakland, Calif., are with us again. They are featuring Mineralights and will send you an attractive colored catalog on these famous lights. Of course they have nice specimens, too, for sale!

L. E. Bagg, formerly of Peoria, Ariz., is now residing in Boulder, Colo. His new classified ad appears in this issue.

Specimens of the best quality! So reads Jno. B. Litsey's ad in this issue. This Dallas, Texas, dealer is stocking up heavily with choice minerals which will be offered collectors thru ROCKS AND MINERALS.

We never heard before of flos-ferri as coming from Utah but Chuck Jordan, of Los Angeles, Calif., has a large stock of this delicate, lacy variety of aragonite. And the locality is in Utah. We bet you will be interested and will rush him an order for a nice specimen!

Collectors who subscribe for the *Mineral Bulletin*, issued by W. Scott Lewis, of Hollywood, Calif., have no doubt spotted the very interesting item on top of page 6 of the February, 1944, number. The item has reference to some very nice Belgian Congo diamond crystals which Mr. Lewis is selling at $1.25 each.